

PATENT

Attorney Docket No. GEN-001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Chandra et al.	CONFIRMATION NO.:	5207
SERIAL NO.:	10/644,582	GROUP NO.:	2166
FILING DATE:	August 20, 2003	EXAMINER:	Pham, Khanh B.
TITLE:	System, Method and Apparatus for Assembling and Mining Life Science Data		

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Commissioner for Patents

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REPLY BRIEF

Grounds of Rejection Addressed Herein

This reply brief is submitted pursuant to 37 C.F.R. §41.41 in reply to the Examiner's Answer of September 18, 2008 (the "Answer") and in conjunction with a Request for an Oral Hearing. In particular, this brief addresses the following points raised in connection with the patentability of Appellants' claims:

- With respect to claims 26 and 101, the Examiner's erroneous contention that the structure of the database described in Kim anticipates the claimed case frames;¹
- With respect to claim 26, the Examiner's erroneous contention that the manual processes for adding data into the Kim database anticipates the claimed selection of a case frame as a template;² and
- With respect to claim 101, the Examiner's erroneous contention that the molecular structures modeled in the Kim database anticipates the claimed biological processes.³

For the reasons that follow, we reiterate our contention that Kim neither discloses nor even suggests every element of the present invention, and that the Examiner's reliance on this reference reflects a fundamental misunderstanding.

¹ Answer at p. 13.

² *Id.*

³ Answer at p. 15.

Arguments

I. The Examiner's Position that a Collection of Vertices and Relationships Within the Kim Database is Equivalent to the Claimed Case Frames is Erroneous

In the Answer mailed on September 18, 2008, the Examiner asserts that “Kim clearly teaches a plurality of case frames” and “also teaches a database for storing a library of case frames.”⁴ This is simply not the case. While the text cited by the Examiner arguably describes a database of similar structure and purpose and the Appellant's database, it is limited to just that. Each example cited by the Examiner references either a general description of a directed graph or portions of a completed, populated database. Neither can be used to add data to the database, which is precisely the purpose of the claimed case frames.

There are two functional modules recited in claim 26 – a database for storing the case frames and an inference engine for selecting a case frame to facilitate the addition of data into the database. Kim has neither. Specifically, Kim's FIG. 1 shows a general description of a gene expression graph comprising nodes and edges. Nowhere in the text of Kim, however, is this described other than as “a diagram showing an example of the basic structure of the disclosed graphs.”⁵ While this figure does include nodes and edges commonly found in a directed graph, it is simply a snapshot of a portion of the resultant database, not a template that can be used to quickly and accurately add new biological data into the database. In fact, nowhere does Kim mention that any particular set of nodes and edges can be used as a template to add data to the database, let alone that the templates are based on a life science ontology, as claimed. It is precisely the existence of a library of case frames stored in a database that permits the rapid addition of life science to the database.

Similarly, the text cited by the examiner (paragraphs [0047], [0055] – [0057] and [0069] – [0098]) merely describes the structure of the data as it exists in the database itself – not a collection of templates used to add data to the database. Appellants are not claiming the database or even the structure of the database, as such data structures are commonplace. Appellants recognized, however, the critical challenge facing life science researchers was the

⁴ Answer at p. 12

⁵ Kim, paragraph [0020].

ability to rapidly, accurately and inexpensively create a database that is as exhaustive as possible. It is this function that did not exist prior to the invention, and is now claimed. In contrast to the claimed library of case frames and inference engine for selecting a proper case frame, Kim's description of adding data to his database is limited to the traditional approach population of data tables using "property_name, value" pairs, a laborious and time-intensive process by which each property of a node and edge must be entered⁶. Again, the each case frame provides not only the basic structure (e.g., node/edge), but a specific structure that is based on a life science ontology, thereby accelerating the data ingestion process, something the standard database table entry process described by Kim cannot provide.

II. The Examiner's Position that Adding Data to a Database Anticipates Selecting a Case Frame is Incorrect

In the Answer, the Examiner contends that "the step to add new data representing the relationship of protein-protein interaction between Yeas [sic] Protein Molecules" anticipates the claimed selection of a case frame from a library of case frames.⁷ Simply put, "adding," i.e., the process of increasing the amount of something is quite different from "selecting," i.e., taking from a group based on a preference. In fact, this distinction supported by the very language cited by the Examiner.

Specifically, to create new data in the Kim database, "vertices representing the two participating protein molecules can be defined first. Once the vertices are defined, an edge can be defined."⁸ Clearly, Kim's technique requires the systematic definition and labeling of new vertices and edges in order to effectuate the addition of new data into the database. Again, this process requires detailed knowledge of the context, structure and content of the data being added – aspects that are effectively modeled and stored as templates in the claimed library of case frames but never addressed by Kim. In contrast, Appellants' claim 26 recites an inference engine that selects a proper case frame based on the data being added and the life science ontology, a feature and functionality wholly absent from Kim's description.

⁶ Kim, paragraph [0077].

⁷ Answer, page 13.

⁸ Kim, paragraph [0095].

The Examiner further contends that paragraphs [0101] – [0110] suggest “a different case frame comprising a set of vertices and edges is selected to represent more complex data.”⁹ This is not the case. The referenced text is merely one example of the type of data that can be modeled using the node-edge notation (e.g., metabolic structures) and how to use the standard node/edge notation to add such data. Critically, it does not describe how to ensure the data conforms to a life science ontology – the primary function of the claimed case frames. Paragraph [0087] of Kim is similarly deficient in supporting the Examiner’s position. When read in context with the paragraphs immediately preceding, it is clear the process being described refers to using two completed vertices (a protein and an Open Reading Frame) to create a third (a gene) by simply concatenating the property_name, value pairs from the two vertices into a single data structure and identifying overlaps. Nowhere in the referenced text (nor in the entire document, for that matter) is there any suggestion that a particular case frame is selected for use and used as a template for adding new assertions to the collection of life science data.

III. The Examiner’s Position that Storing Certain Molecular Structures Anticipates the Modeling of Biological Processes is Incorrect

We therefore respectfully submit that the Examiner’s rejections reflect a misapplication and overgeneralization of the reference relied upon in rejecting the present claims.

⁹ Answer, page 14.

Conclusion

Appellants respectfully submit that the Examiner has failed to meet his burden of establishing that the limitations of the present claims are met by the references of record — alone or in combination. Appellants therefore request the Board of Patent Appeals and Interferences to reverse the Examiner's rejections and direct that this application be passed to issuance.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 07-1700.

Respectfully submitted,

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